

In step 460, routing attributes (min/max capacity, activity factor, charges and resource usage) may be inherited and may be overridden. Further, formula validity rules may be inherited and may be overridden in this step.

5 In step 470, if the routing is setup for automatic step calculation, the user may associate the formula material to the appropriate routing steps in step. Quantities and charges may be automatically calculated for each process step in step 470.

10 Process instructions may also be defined for each stage of the process in step 470. Further, in step 470, throughput (process quantity and usage) may be overridden based on ingredient characteristics.

15 Figure 5 depicts an exemplary recipe creation window 500, according to an embodiment of the present invention. The recipe creation window 500 may display when the user selects the New option available from the right mouse menu 140, the Toolbar, the Edit menu and from the recipe summary window 300 as well as the Recipe Detail window (not shown). This may prompt the user to enter administrative information (organization, laboratory, project, recipe number, version, description and type) and to identify the formula and routing to be used in the recipe.

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If the user enters a product number, the user may be required to enter the product quantity as well. The formula number/versions may be protected against data entry. If more than one effective formula is located (based on formula validity rules), a list showing all valid formulas displays. The user must select one formula  
25 from this list prior to proceeding with the recipe creation process.

If the user entered a product number, the formula number / version field may be protected against data entry. Otherwise, the user may be prompted to enter a valid formula number/version. It may not be mandatory to specify a routing for creating a recipe. Note that only routings that have a type compatible with the recipe type may be accepted.

Figure 6 depicts a recipe maintenance window 600 for editing a routing, according to an embodiment of the present invention. Recipe window 600 may display when the user selects a recipe node or presses a detail button 320 from the recipe summary display. Window 600 may be activated based on a user selection of tab 600a.

Recipe maintenance window 600 may include a step quantity window 610 that contains line items relating to operations that are defined for the routing. As described further below, many fields may be defined for each line item, such as operation name, activity, Factor, resource, quantity, etc.

Recipe maintenance window 600 may further include recipe header window 620. Recipe header window may display various items defined for a recipe, including organization, laboratory, project, recipe number, version and type, a description of the recipe, a formula used in the selected recipe, a routing used in a recipe, theoretical and predicted losses and an owner of the selected recipe.

Several types of information in the recipe header window 620 may be edited by the user. A recipe description may be edited by the user. The user may also edit the recipe owner field. This may be the actual owner of the recipe. This

field may default to the user creating the recipe and can be overridden. If overridden, an alert may be sent to notify the owner.

5 The step quantity window 610 may display when the user selects a recipe node or presses the Detail button 320 from the recipe summary window 300.

Still referring to Figure 6, recipe maintenance window 600 may further include expansion display 640 which displays greater detail of an item selected in step quantity window 610.

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Recipe maintenance window 600 may further include a step material association button 630 that, when activated, allows a user to edit the relationships between process steps and the materials associated with those process steps.

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Embodiments of the present invention may support definition and maintenance of material loss during the production process at both operation step and routing levels.

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If an option to account for process loss at operation level is enabled, the routing process loss shows the rolled up value derived from operations and editing may be prevented.

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If the option to maintain process loss at routing level is enabled, the planned process loss defaults from the theoretical process loss upon recipe creation. This may be changed within a pre-defined tolerance factor, for example:

Routing Planned Process Loss > Routing Theoretical Process Loss \* (1 - Tolerance %)  
AND